

U.S.S.N. 09/588,788

Remarks

Thorough examination by the Examiner is noted and appreciated.

The claims have been amended and new claims added to further clarify Applicants invention.

No new matter has been added.

For example support for the amendments and new claims are found in the previously presented claims and the Specification:

See discussion beginning on line 13, page 13 to line 7, page 14,

Claim Rejections under 35 USC 112

1. Claims 4, 5, and 18 stand rejected under 35 U.S.C. 112, first paragraph as failing to comply with the written description requirement.

Examiner alleges that the phrase "progressing in any

U.S.S.N. 09/588,788

direction" apparently read in isolation from the rest of the claims can include any directions of the spiral conductor layer where the directions are not planar.

Examiner has not explained how or why one of ordinary skill would not understand the phrase "progressing in any direction" in the context of the entire claim including the portion in Bold type:

"**forming over the substrate a planar spiral conductor layer to form a planar spiral inductor, wherein a successive series of loops within the planar spiral conductor layer is formed with a progressive and discontinuous variation progressing in any direction from a center of said spiral defined by a first loop to a periphery of said series of loops at least one of:**"

While Applicants do not agree that one of ordinary skill would not understand the plain meaning of Applicants language (which clearly means that **it is the variation that is progressing in any direction** (rather than the planar spiral conductor layer as Examiner interprets), i.e., it is clear that **the variation is progressing from a center to a periphery of said series of loops**), Applicants have nevertheless amended the claim language in an effort to further prosecution on the merits.

U.S.S.N. 09/588,788

2. Claims 4, 5, and 18 stand rejected under 35 U.S.C. 112, second paragraph for failing to particularly point out and distinctly claim the subject matter which Applicants regard as their invention.

Applicants have amended the claims to overcome Examiners interpretation of Applicants claim language.

Claim Rejections under 35 USC 102

3. Claims 1, 4, 6, 8, and 16-18 stand rejected under 35 USC 102(b) as being anticipated by Haas (4,016,519).

Haas et al. teach forming a printed circuit coil (Haas et al. teach that forming an inductive coil as an integrated circuit structure is impractical) on one or both sides of a plate of insulating material with a ferromagnetic core mounted in a hole at the center of the coil (i.e., a **magnetic transducer**) (see Abstract; col 1, lines 1-15; lines 31-37). Contacts (2, Figure 1) are also located at the center of the coil (see col 2, lines 34-37).

Haas et al. teach increasing the path width of the spiral

U.S.S.N. 09/588,788

conductor from the inside of the coil to the outside of the coil with a constant spacing between the turns of the coil (see col 2, lines 38-43). Haas et al. teach oval, circular or pear shapes (col 2, lines 23-25).

Thus, Haas fails to disclose several aspects of Applicants disclosed and claimed invention including those elements in **bold type**:

With respect to claim 1:

"A method for fabricating **an integrated circuit planar inductor** with an enhanced Q value comprising:

providing a substrate comprising a **dielectric layer over a semiconductor substrate**;

forming over the substrate a planar spiral conductor layer comprising a single spiral to form **a planar spiral inductor**, wherein a successive series of loops within the planar spiral conductor layer is formed with a progressive and discontinuous variation, said variation progressing from a center of said spiral defined by a first loop to a periphery of said series of loops at least one of:

a series of progressive stepwise changes in linewidths

U.S.S.N. 09/588,788

to form a series of discrete linewidths for the successive series of loops; and

a series of progressive stepwise changes in spacings separating the successive series of loops."

With respect to claim 4:

"A method for fabricating an **integrated circuit planar inductor** with an enhanced Q value comprising:

providing a substrate comprising a dielectric layer over a semiconductor substrate;

forming on the substrate a planar spiral conductor layer to form a **planar spiral inductor**, wherein a successive series of loops within the planar spiral conductor layer is formed with a progressive and discontinuous variation, said variation progressing in any direction from a center of said spiral defined by a first loop to a periphery of said series of loops, said variation comprising at least one of:

a series of progressive stepwise changes in linewidths to form a series of discrete linewidths for the successive series of

U.S.S.N. 09/588,788

loops; and

a series of progressive stepwise changes in spacings separating the successive series of loops;

wherein the successive series of loops is formed in a shape selected from the group consisting of a triangle, a square, a rectangle, a higher order polygon, a uniform ellipse and a circle, wherein said center of said spiral consists of said dielectric layer."

With respect to new claim 21:

"A method for fabricating an **integrated circuit planar inductor** with an enhanced Q value comprising:

· providing a substrate **comprising a dielectric layer over a semiconductor substrate;**

· forming over the substrate a planar spiral conductor layer comprising a single spiral to form a **planar spiral inductor**, wherein a successive series of loops within the planar spiral conductor layer is formed with a progressive and

U.S.S.N. 09/588,788

discontinuous variation progressing from a center of said spiral defined by a first loop to a periphery of said series of loops, said variation comprising **a series of progressive stepwise changes in spacings separating the successive series of loops."**

Thus, Haas is clearly insufficient to anticipate Applicants disclosed and claimed invention.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

"The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claim Rejections under 35 USC 103

3. Claim 5 stands rejected under 35 USC 103(a) as being unpatentable over Haas (4,016,519).

U.S.S.N. 09/588,788

Applicants reiterate the comments made above with respect to Haas.

Examiner rejects Examiners Official notice that forming a planar spiral conductor layer is conventional, old, and notoriously well known in the art of forming inductors. Examiner has not shown Applicants planar spiral conductor layer forming an integrated circuit planar spiral inductor in the prior art. Even assuming Examiner were to produce a reference showing the formation of an integrated circuit planar spiral inductor using one or more of the materials in claim 5, such a showing would not help Examiner in making our a prima facie case of obviousness.

The citation of Wollnick "to show obviousness" by Examiner also does not help Examiner, since Wollnick disclose an entirely different structure (a coil arrangement for the electromagnetic superposition and correction of magnetic fields emanating from the pole shoes of a magnet (see col 1, lines 1-14) where a copper laminated material is used for the correcting coils to increase a current density), does not further help Examiner in producing Applicants disclosed and claimed invention.

U.S.S.N. 09/588,788

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

3. Claim 7 stands rejected under 35 USC 103(a) as being unpatentable over Haas, above, in view of Murphy (5,844,451) and Esper et al. (4,613,843).

Applicants reiterate the comments made above with respect to Haas.

Even assuming *arguendo* a proper motivation for combination, the fact that Murphy teaches linewidths for a novel integrated circuit element that exhibits the characteristics of a **series capacitor-inductor network** where at least **two coils having constant width and spacing** are formed stacked on one another and with a dielectric between them, does not further help Examiner in producing Applicants invention.

U.S.S.N. 09/588,788

Moreover, any attempt to modify the **printed circuit magnetic transducer of Haas** with the integrated circuit **series capacitor-inductor network of Murphy** would change the principle of operation of the device of Haas, and make it unsuitable for its intended purpose.

Even assuming *arguendo* a proper motivation for combination, the fact that Esper teaches linewidths for a planar magnetic transducer formed on an insulating substrate, does not further help Examiner in producing Applicants invention.

Likewise, any attempt to modify the integrated circuit **series capacitor-inductor network of Murphy** with **magnetic transducer of Esper** with would change the principle of operation of the device of Murphy, and make it unsuitable for its intended purpose.

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

U.S.S.N. 09/588,788

"A prior art reference must be considered in its entirety, i.e., as a whole including portions that would lead away from the claimed invention." *W.L. Gore & Associates, Inc., Garlock, Inc., 721 F.2d, 1540, 220 USPQ 303 (Fed Cir. 1983)*, cert denied, 469 U.S. 851 (1984).

"Finally, when evaluating the scope of a claim, every limitation in the claim must be considered. Office personnel may not dissect a claimed invention into discrete elements and then evaluate the elements in isolation. Instead, the claim as a whole must be considered." See, e.g., *Diamond v. Diehr*, 450 U.S. at 188-189, 209 USPQ at 9.

"If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie obvious*." *In re Ratti*, 270 F.2d 810, 123, USPQ 349 (CCPA 1959).

"If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed

U.S.S.N. 09/588,788

modification." *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Conclusion

The cited references, alone or in combination, do not produce Applicants disclosed and claimed invention, and therefore fail to make out a *prima facie* case of anticipation or obviousness with respect to both Applicants independent and dependent claims.

Moreover, none of the cited references disclose a method or structure that recognizes or overcomes the problem that Applicants have recognized and solved by their disclosed and claimed invention:

"A method for fabricating an **integrated circuit planar inductor** with an enhanced Q value comprising:

The Claims have been amended and new claims added to further clarify Applicants invention. A favorable consideration of Applicants' claims is respectfully requested.

U.S.S.N. 09/588,788

Based on the foregoing, Applicants respectfully submit that the Claims are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

In the event that the present invention as claimed is not in condition for allowance for any reason, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,
Tung & Associates

Randy W. Tung
Reg. No. 31,311
Telephone: (248) 540-4040